MS APPEAL BRIEF
PATENT
0879-0277P

IN THE U.S. PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF		BEFORE THE BOARD OF APPEALS	
Seiichi MATSUI		Appeal No.:	
APPL. NO.:	09/662,323	GROUP:	2612
FILED:	September 14, 2000	Examiner:	K. L. JERABEK
FOR:	IMAGING APPARATUS, SOLID IMAGING DEVICE AND DRIVING METHOD FOR SOLID IMAGING DEVICE		

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APPEAL BRIEF ON BEHALF OF APPELLANT: Seiichi MATSUI

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I. REAL PARTY IN INTEREST

The real party in interest for this application is the Assignee, FUJI PHOTO FILM CO., LTD., No. 210, Nakanuma, Minami-Ashigara-shi, Kanagawa, JAPAN.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences pending with respect to the subject matter of the present application.

III. STATUS OF CLAIMS

Claims 4-12 and 16-24 remain pending. Claims 4, 11-12, and 23-24 are independent. No claims have been allowed.

IV. STATUS OF AMENDMENTS

No amendments have been presented after the Final Rejection.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention of the subject application provides for an imaging apparatus comprising a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors [Specification, page 8, lines 19-22], said solid imaging device comprises a matrix of transferring gates, to which gate pulses for transferring only the pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes are applied when image signals with low definition are produced [Specification, Fig. 3; page 8, line 26 though page 9, line 5]; a shooting optical system that forms a subject image on a receiving surface of said solid imaging device [Specification, page 10, line 28 through page 11, line 1]; a timing generator that drives said solid imaging device and reads pixel information from said solid imaging device, the timing generator applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes to said transferring gates when image signals with low definition are produced [Specification, page 11, lines 2-6]; and a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced [Specification, page 11, lines 7-10].

The imaging apparatus further provides for the timing generator applying gate pulses for transferring pixel information of all the vertical lines to said vertical transferring routes without reducing the pixel information to said transferring gates at least when image signals with high definition are produced [Specification, page 7, line 19 through page 7, line 9].

The imaging apparatus further provides for the timing generator applying gate pulses for dividing pixel information of all the vertical lines into pixel information of a plurality of fields to transfer the pixel information to said vertical transferring routes to said transferring gates at least when image signals with high definition are produced [Specification, page 11, lines 10-18].

The imaging apparatus further provides for the signal processing device reducing pixel information of horizontal lines when image signals with low definition are produced [Specification, page 9, lines 20-24].

The imaging apparatus further provides for the signal processing device having an interpolation operation device that interpolates the image signals with the low definition to produce image signals; and the signal processing device outputs image signals including the produced image signals [Specification, page 10, lines 15-19].

The imaging apparatus further comprises a displaying device that displays a shot image according to the image signals with the low definition [Fig. 1, reference 28].

The imaging apparatus further comprises a recording device that records the image signals of the high definition [Fig. 1, reference 26].

Alternatively, the invention of the present application provides for a driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of applying gate pulses for transferring pixel information of all vertical lines to vertical transferring routes without reducing the pixel information to a matrix of transferring gates when image signals with high definition are produced [Specification, page 7, line 19 through page 7, line 9]; applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said matrix of transferring gates when image signals with low definition are produced [Specification, Fig. 3; page 8, line 26 though page 9, line 5];

and producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced [Specification, page 11, lines 7-10].

Alternatively, the invention of the subject application provides for a driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of applying gate pulses for dividing pixel information of all vertical lines into pixel information of a plurality of fields and transferring the pixel information to vertical transferring routes to a matrix of transferring gates when image signals with high definition are produced [Specification, page 7, line 19 through page 7, line 9]; applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said matrix of transferring gates when image signals with low definition are produced [Specification, Fig. 3; page 8, line 26 though page 9, line 5]; and producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced [Specification, page 11, lines 7-10].

Alternatively, the invention of the subject application provides for an imaging apparatus comprising a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, said solid imaging device comprises transferring gates, each associated with a photoelectric transferring device, to which gate pulses for transferring only the pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes are applied when image signals with low definition are produced [Specification, Fig. 3; page 8, line 26 though page 9, line 5]; a shooting optical system that forms a subject image on a receiving surface of said solid imaging device [Specification, page 10, line 28 through page 11, line 1]; a timing generator that drives said solid imaging device and reads

pixel information from said solid imaging device, the timing generator applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes to said transferring gates when image signals with low definition are produced [Specification, Fig. 3; page 8, line 26 though page 9, line 5]; and a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced [Specification, page 11, lines 7-10].

The summary of the claimed invention herein has been made to comply with the Patent Office rules in submitting briefs and is not to be considered as limiting the claimed invention.

VI. THE GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner has rejected claims as follows:

(1) Claims 4-7, 9-12, 16-19 and 21-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yamaguchi et al.* (USP 6,342,921) (hereinafter "*Yamaguchi*) in view of *Harada et al.* (USP 6,108,036) (hereinafter "*Harada*"); and

(2) Claims 8 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yamaguchi* in view of *Harada* and further in view of *Dischert* (USP 6,040,869) (hereinafter "*Dischert*").

VII. ARGUMENTS

A. Claims 4-7, 9-12, 16-19 and 21-24 Are Patentable over *Yamaguchi* in view of *Harada*

1. Argument Summary

The reasoning provided in support of the rejection of claims 4-7, 9-12, 16-19 and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over *Yamaguchi* in view of *Harada* fails to establish prima facie obviousness. Generally, the deficiencies of the rejection are that the rejection attributes certain claim features to the references that a detailed reading of the references reveals are not taught therein; as the nature and the purpose of the device of *Yamaguchi* is recognized, it is evident that there is no suggestion or motivation in either of the references cited in support of the rejection or in knowledge generally available to those skilled in the art to modify *Yamaguchi* in the manner asserted by the rejection; and by asserting that certain modifications of the device of *Yamaguchi* would have been obvious without proper suggestion or motivation in the applied references or elsewhere to make the asserted modifications, the rejection appears to rely on impermissible hindsight. Such deficiencies exist for the rejection of each of claims 4-7, 9-12, 16-19 and 21-24.

2. The Legal Requirements of *Prima Facie* Obviousness

To establish *prima facie* obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of the prior art must be supported by some teaching, suggestion, or motivation in the applied references or in knowledge generally available to one skilled in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a *prima facie* case of obviousness. *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the

prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); *In re Ehrreich*, 590 F.2d 902, 908-909, 200 USPQ 504, 510 (C.C.P.A. 1979).

The teaching or suggestion to make the asserted combination or modification of the primary reference must be found in the prior art and cannot be gleaned from applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In other words, the use of hindsight to reconstruct the claimed invention is impermissible. *Uniroyal Inc. v. Rudlan-Wiley Corp.*, 5 USPQ 1434 (Fed. Cir. 1983).

Finally, when considering the differences between the primary reference and the claimed invention, the question for assessing obviousness is not whether the differences themselves would be been obvious, but instead whether the claimed invention as a whole would have been obvious. *Stratoflex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

3. The Rejection Fails to Establish Prima Facie Obviousness of Independent Claim 4

Independent claim 4 is directed to an imaging apparatus comprising a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, said solid image device comprises a matrix of transferring gates, to which gate pulses for transferring only the pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes are applied when image signals with low definition are produced; a shooting optical system that forms a subject image on a receiving surface of said solid imaging device; a timing generator that drives said solid imaging device and reads pixel information from said solid imaging device, the timing generator applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes to said transferring gates when image signals with low definition are produced; and a signal processing device that produces the image signals by

producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

a. The cited references fail to teach or suggest all of the claim elements as set forth in independent claim 4

In maintaining the Examiner's rejection of independent claim 4, the Examiner asserts in the Final Official Action on page 4, as follows:

> ...However, Yamaguchi does not disclose a signal processing device that produces pixel information of one line from the pixel information of each pair of two adjoining lines when image signals of low definition are produced.
>
> Harada discloses in figure 1 an imaging apparatus (1) including a solid imaging device (14-16) and an optical system (3). The imaging apparatus (1) disclosed by Harada includes a signal processing device (72) that produces image signals by producing pixel information of one line from the pixel information of a pair of two adjoining lines read from the solid imaging device (fig. 9; col. 34, lines 23-41). Therefore it would have been obvious for one skilled in the art to have been motivated to include the signal processing device capable of producing image signals by producing pixel information of lone line from the pixel information of a pair of adjoining lines as disclosed by Harada in the image pickup device capable of performing a line thinning operation as disclosed by Yamaguchi. Doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field (Harada: col. 34, lines 20-27).

Appellant disagrees that *Harada* discloses producing image signals by producing the pixel information of one line from the pixel information of each pair of two adjoining lines read from the solid imaging device when the image signals with low definition are produced.

The disclosure of *Yamaguchi* is directed to a lattice-type solid state image pickup device. At col. 12, lines 39-61, *Yamaguchi* discloses as follows:

> Since the above CCD can sequentially generate the signals of all pixels without mixing, it is suitable for an electronic still camera and an image fetching. However, as compared with an image pickup device for a video camera having the same number of pixels for performing an interlace output, when the charges are transferred by the same clock, an output time of one picture plane (from the top to the bottom of the screen) is doubled. In this example, as mentioned above, as a signal for monitoring and an image pickup signal

> for the automatic control such as an auto focus control and the like, by reducing the number of horizontal lines, the image pickup signal of one picture plane is outputted at a high speed and, in case of the line thinning, a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented. On the other hand, in case of fetching the photographed image into the flash memory, the image pickup signal of the full-frame (image pickup signal in which the number of lines is not thinned or decimated) is generated. Even in case of the line thinning, since the color sequence is the same as the case of the full frame, a problem such that the signal processing circuit is complicated can be avoided.

In other words, *Yamaguchi* teaches reading out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit.

The disclosure of *Harada* is directed to an imaging apparatus having a spatial filter and image shifting mechanism controller based on an image mode. At col. 34, lines 23-41, *Harada* discloses as follows:

> The FIG. 9 shows an equivalent circuit to the signal processing circuit 72 in the first imaging mode. In this method, the circuit outputs {(N/2).times.M} kinds of add signals during output from each field.
>
> Combinations of light-receiving regions d to be added differ depending upon a time when the first field outputs or when the second field outputs. In the case of output from the first field, for example, a light-receiving signal from a light-receiving region d(n, m) belonging to the n-th row and the m-th column array is added to a light-receiving signal from a light-receiving region d(n+1, m) belonging to the (n+1)-th row and the m-th column array. In the case of output from the second field, a light-receiving signal from a light-receiving region d(n, m) is added to a light-receiving signal from a light-receiving region d(n-1, m) belonging to the (n-1)-row and the m-th column array. The processing method for reading the light-receiving signal is generally referred to as "interlacing" or "two-pixel-mixing reading".

As noted above, *Harada* discloses processing one light-receiving signal with another light-receiving signal. However, according to the teachings of *Yamaguchi*, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such, in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, assuming these references are

combinable which Appellant does not admit, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced."

As the Examiner has failed to provide references that teach or suggest all of the claim elements, Appellant respectfully submits the Examiner has failed to establish prima facie obviousness.

b. The Examiner has failed to provide proper motivation in support of his rejection of independent claim 4

In support of the Examiner's rejection of claim 4 in the Final Official Action on page 4, the Examiner asserts as follows:

> Therefore it would have been obvious for one skilled in the art to have been motivated to include the signal processing device capable of producing image signals by producing pixel information of lone line from the pixel information of a pair of adjoining lines as disclosed by Harada in the image pickup device capable of performing a line thinning operation as disclosed by Yamaguchi. Doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field (Harada: col. 34, lines 20-27).

The Examiner concludes it would have been obvious to one of ordinary skill in the art to modify the method disclosed in *Yamaguchi* to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by *Harada* in the image pickup device capable of performing a line thinning operation as disclosed by *Yamaguchi,* asserting doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field. Appellant respectfully disagrees that there is motivation to combine the references and further disagree that these references are properly combinable.

The mode described in *Yamaguchi* is low resolution while the mode in *Harada* is high resolution. The Examiner asserts in the final Official Action on page 3 as follows:

> Although the Yamaguchi reference discloses a thinning operation for readout and the Harada reference discloses a method where all of the pixels of an imaging array are read out, this does not prevent the two references from being combined. The Harada reference is cited for the purpose of disclosing a method of producing pixel information of one line from pixel information of two adjoining lines (interlacing) and the Yamaguchi reference discloses applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines.

The Examiner's comments fail to address why one skilled in the art would be so motivated to combine the references as asserted by the Examiner. The portion of the reference the Examiner is relying upon in support of his rejection is based upon an interlaced VGA signal, which energizes pixels in an alternate manner. *Yamaguchi* reads out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit. Because only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by *Harada*. Support for this argument may be found in *Yamaguchi* in col. 12, lines 39-60.

Further, *Yamaguchi* specifically supports Appellant's argument by teaching "a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented." As such, Appellant maintains that one skilled in the art would not be motivated to combine the averaging of *Harada* with the teachings of *Yamaguchi*.

c. Yamaguchi teaches away from the purported combination

Yamaguchi seeks to provide a device that obtains "an image of a good resolution" (col. 17, lines 25-26). In combining the teachings of the references, as suggested by the Examiner, *Yamaguchi* would effectively be processing one energized or charged row of pixels with one non-energized or non-charged row of pixels. By doing this, signal quality would be reduced. This is contrary to the purpose and express teachings of *Yamaguchi* as noted above. As such,

Appellant respectfully submits that one skilled in the art would not modify *Yamaguchi* as purported by the Examiner as *Yamaguchi* teaches away from the purported modification.

d. The rejection of independent claim 4 relies on impermissible hindsight reasoning

By asserting it would have been obvious to modify *Yamaguchi* to include the features of *Harada*, with no suggestion or motivation in the applied references or elsewhere to do so, the rejection appears to rely on impermissible hindsight reasoning. As such, Appellant maintains that independent claim 4 is patentable over *Yamaguchi* in view of *Harada*.

4. The Rejection Fails to Establish Prima Facie Obviousness of Dependent Claims 5-10

Claims 5-10 depend directly on claim 4. Appellant submits that claims 5-10 are allowable for the reasons set forth above with regard to claim 4 at least based upon their dependency on claim 4. Appellant further submits that dependent claims 5-10 are separately patentable and offer the following additional arguments for the invention of claim 5-10.

The rejection of these claims asserts that *Yamaguchi* teaches the incremental features recited therein. Appellant submits, however, that the rejection's reliance on *Yamaguchi* as allegedly teaching these incremental features fails to make up for the deficiencies of the rejection applied to claim 4. Thus *Yamaguchi*, taken alone or in combination with *Harada*, assuming these references are combinable, which Appellant does not admit, fails to establish *prima facie* obviousness of dependent claims 5-10.

5. The Rejection Fails to Establish Prima Facie Obviousness of Independent Claim 11

Independent claim 11 is directed to a driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of applying gate pulses for transferring pixel information of all vertical lines to vertical transferring routes without reducing the pixel information to a matrix of transferring

gates when image signals with high definition are produced; applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said matrix of transferring gates when image signals with low definition are produced; and producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

a. The cited references fail to teach or suggest all of the claim elements as set forth in independent claim 11

In support of the Examiner's rejection of claim 11, the Examiner asserts "Re claim 11, see claim 5." Appellant respectfully disagrees that *Harada* discloses producing image signals by producing the pixel information of one line from the pixel information of each pair of two adjoining lines read from the solid imaging device when the image signals with low definition are produced.

As noted above with regard to claim 4, *Harada* discloses processing one light-receiving signal with another light-receiving signal. However, according to the teachings of *Yamaguchi*, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such, in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, assuming these references are combinable which Appellant does not admit, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced."

As the Examiner has failed to provide references that teach or suggest all of the claim elements, Appellant respectfully submits the Examiner has failed to establish prima facie obviousness.

b. The Examiner has failed to provide proper motivation in support of his rejection of independent claim 11

The Examiner asserts it would have been obvious to one of ordinary skill in the art to modify the method disclosed in *Yamaguchi* to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by *Harada* in the image pickup device capable of performing a line thinning operation as disclosed by *Yamaguchi,* asserting doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field. Appellant respectfully disagrees that there is motivation to combine the references and further disagree that these references are properly combinable.

As noted above with regard to claim 4, the portion of the reference the Examiner is relying upon in support of his rejection is based upon an interlaced VGA signal, which energizes pixels in an alternate manner. *Yamaguchi* reads out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit. Because only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by *Harada*. Support for this argument may be found in *Yamaguchi* in col. 12, lines 39-60.

Further, *Yamaguchi* specifically supports this argument by teaching "a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented." As such, Appellant maintains that one skilled in the art would not be motivated to combine the averaging of *Harada* with the teachings of *Yamaguchi*.

c. Yamaguchi teaches away from the purported combination

As noted above with regard to claim 4, *Yamaguchi* seeks to provide a device that obtains "an image of a good resolution" (col. 17, lines 25-26). In combining the teachings of the references, as suggested by the Examiner, *Yamaguchi* would effectively be processing one energized or charged row of pixels with one non-energized or non-charged row of pixels. By doing this, signal quality would be reduced. This is contrary to the purpose and express teachings of *Yamaguchi* as noted above. As such, Appellant respectfully submits that one skilled in the art would not modify *Yamaguchi* as purported by the Examiner as *Yamaguchi* teaches away from the purported modification.

d. The rejection of independent claim 11 relies on impermissible hindsight reasoning

By asserting it would have been obvious to modify *Yamaguchi* to include the features of *Harada*, with no suggestion or motivation in the applied references or elsewhere to do so, the rejection appears to rely on impermissible hindsight reasoning. As such, Appellant maintains that independent claim 11 is patentable over *Yamaguchi* in view of *Harada*.

6. The Rejection Fails to Establish Prima Facie Obviousness of Independent Claim 12

Independent claim 12 is directed to a driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of applying gate pulses for dividing pixel information of all vertical lines into pixel information of a plurality of fields and transferring the pixel information to vertical transferring routes to a matrix of transferring gates when image signals with high definition are produced; applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said matrix of transferring gates when image signals with low definition are produced; and producing pixel

information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

a. The cited references fail to teach or suggest all of the claim elements as set forth in independent claim 12

In maintaining the Examiner's rejection of independent claim 12, the Examiner asserts in the Final Official Action on page 8, "Re claim 12, see claim 6."

Appellant disagrees that *Harada* discloses producing image signals by producing the pixel information of one line from the pixel information of each pair of two adjoining lines read from the solid imaging device when the image signals with low definition are produced.

As noted above with regards to claim 4, *Harada* discloses processing one light-receiving signal with another light-receiving signal. However, according to the teachings of *Yamaguchi*, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such, in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, assuming these references are combinable which Appellant does not admit, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced."

As the Examiner has failed to provide references that teach or suggest all of the claim elements, Appellant respectfully submits the Examiner has failed to establish prima facie obviousness.

b. The Examiner has failed to provide proper motivation in support of his rejection of independent claim 12

The Examiner asserts it would have been obvious to one of ordinary skill in the art to modify the method disclosed in *Yamaguchi* to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by *Harada* in the image pickup device capable of performing a line thinning operation as disclosed by *Yamaguchi,* asserting doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field. Appellant respectfully disagrees that there is motivation to combine the references and further disagree that these references are properly combinable.

As noted above with regard to claim 4, the portion of the reference the Examiner is relying upon in support of his rejection is based upon an interlaced VGA signal, which energizes pixels in an alternate manner. *Yamaguchi* reads out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit. Because only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by *Harada.* Support for this argument may be found in *Yamaguchi* in col. 12, lines 39-60.

Further, *Yamaguchi* specifically supports Appellant's argument by teaching "a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented." As such, Appellant maintains that one skilled in the art would not be motivated to combine the averaging of *Harada* with the teachings of *Yamaguchi.*

c. Yamaguchi teaches away from the purported combination

Yamaguchi seeks to provide a device that obtains "an image of a good resolution" (col. 17, lines 25-26). In combining the teachings of the references, as suggested by the Examiner, *Yamaguchi* would effectively be processing one energized or charged row of pixels with one

non-energized or non-charged row of pixels. By doing this, signal quality would be reduced. This is contrary to the purpose and express teachings of *Yamaguchi* as noted above. As such, Appellant respectfully submits that one skilled in the art would not modify *Yamaguchi* as purported by the Examiner as teaches away from the purported modification.

d. The rejection of independent claim 12 relies on impermissible hindsight reasoning

By asserting it would have been obvious to modify *Yamaguchi* to include the features of *Harada*, with no suggestion or motivation in the applied references or elsewhere to do so, the rejection appears to rely on impermissible hindsight reasoning. As such, Appellant maintains that independent claim 12 is patentable over *Yamaguchi* in view of *Harada*.

7. The Rejection Fails to Establish Prima Facie Obviousness of Independent Claim 16

Independent claim 16 is directed to an imaging apparatus comprising a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, said solid imaging device comprises transferring gates, each associated with a photoelectric transferring device, to which gate pulses for transferring only the pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes are applied when image signals with low definition are produced; a shooting optical system that forms a subject image on a receiving surface of said solid imaging device; a timing generator that drives said solid imaging device and reads pixel information from said solid imaging device, the timing generator applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes to said transferring gates when image signals with low definition are produced; and a signal processing device that produces the image signals by producing pixel information of one line from the pixel

information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

a. The cited references fail to teach or suggest all of the claim elements as set forth in independent claim 16

In maintaining the Examiner's rejection of independent claim 16, the Examiner asserts in the Final Official Action on page 8, "Re claim 16, see claim 4."

Appellant disagrees that *Harada* discloses producing image signals by producing the pixel information of one line from the pixel information of each pair of two adjoining lines read from the solid imaging device when the image signals with low definition are produced.

As noted above with regards to claim 4, *Harada* discloses processing one light-receiving signal with another light-receiving signal. However, according to the teachings of *Yamaguchi*, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such, in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, assuming these references are combinable which Appellant does not admit, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced."

As the Examiner has failed to provide references that teach or suggest all of the claim elements, Appellant respectfully submits the Examiner has failed to establish prima facie obviousness.

b. The Examiner has failed to provide proper motivation in support of his rejection of independent claim 16

The Examiner asserts it would have been obvious to one of ordinary skill in the art to modify the method disclosed in *Yamaguchi* to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by *Harada* in the image pickup device capable of performing a line thinning operation as disclosed by *Yamaguchi,* asserting doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field. Appellant respectfully disagrees that there is motivation to combine the references and further disagree that these references are properly combinable.

As noted above with regard to claim 4, the portion of the reference the Examiner is relying upon in support of his rejection is based upon an interlaced VGA signal, which energizes pixels in an alternate manner. *Yamaguchi* reads out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit. Because only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by *Harada*. Support for this argument may be found in *Yamaguchi* in col. 12, lines 39-60.

Further, *Yamaguchi* specifically supports this argument by teaching "a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented." As such, Appellant maintains that one skilled in the art would not be motivated to combine the averaging of *Harada* with the teachings of *Yamaguchi*.

c. Yamaguchi teaches away from the purported combination

Yamaguchi seeks to provide a device that obtains "an image of a good resolution" (col. 17, lines 25-26). In combining the teachings of the references, as suggested by the Examiner, *Yamaguchi* would effectively be processing one energized or charged row of pixels with one

non-energized or non-charged row of pixels. By doing this, signal quality would be reduced. This is contrary to the purpose and express teachings of *Yamaguchi* as noted above. As such, Appellant respectfully submits that one skilled in the art would not modify *Yamaguchi* as purported by the Examiner as *Yamaguchi* teaches away from the purported modification.

d. The rejection of independent claim 16 relies on impermissible hindsight reasoning

By asserting it would have been obvious to modify *Yamaguchi* to include the features of *Harada*, with no suggestion or motivation in the applied references or elsewhere to do so, the rejection appears to rely on impermissible hindsight reasoning. As such, Appellant maintains that independent claim 16 is patentable over *Yamaguchi* in view of *Harada*.

8. The Rejection Fails to Establish Prima Facie Obviousness of Dependent Claims 17-22

Claims 17-22 depend directly on claim 16. Appellant submits that claims 17-22 are allowable for the reasons set forth above with regard to claim 16, and claim 4, at least based upon their dependency on claim 16. Appellant further submits that dependent claims 17-22 are separately patentable and offer the following additional arguments for the invention of claim 17-22.

The rejection of these claims asserts that *Yamaguchi* teaches the incremental features recited therein. Appellant submits, however, that the rejection's reliance on *Yamaguchi* as allegedly teaching these incremental features fails to make up for the deficiencies of the rejection applied to claim 16. Thus *Yamaguchi*, taken alone or in combination with *Harada*, assuming these references are combinable, which Appellant does not admit, fails to establish *prima facie* obviousness of dependent claims 17-22.

9. The Rejection Fails to Establish Prima Facie Obviousness of Independent Claim 23

Independent claim 23 is directed to a driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of applying gate pulses for transferring pixel information of all vertical lines to vertical transferring routes without reducing the pixel information to transferring gates, each associated with a photoelectric transferring device, when image signals with high definition are produced; applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said transferring gates when image signals with low definition are produced; and producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

a. The cited references fail to teach or suggest all of the claim elements as set forth in independent claim 23

In maintaining the Examiner's rejection of independent claim 23, the Examiner asserts in the Final Official Action on page 9, "Re claim 23, see claim 5."

Appellant disagrees that *Harada* discloses producing image signals by producing the pixel information of one line from the pixel information of each pair of two adjoining lines read from the solid imaging device when the image signals with low definition are produced.

As noted above with regards to claim 4, *Harada* discloses processing one light-receiving signal with another light-receiving signal. However, according to the teachings of *Yamaguchi*, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such, in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, assuming

these references are combinable which Appellant does not admit, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced."

As the Examiner has failed to provide references that teach or suggest all of the claim elements, Appellant respectfully submits the Examiner has failed to establish prima facie obviousness.

b. The Examiner has failed to provide proper motivation in support of his rejection of independent claim 23

The Examiner asserts it would have been obvious to one of ordinary skill in the art to modify the method disclosed in *Yamaguchi* to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by *Harada* in the image pickup device capable of performing a line thinning operation as disclosed by *Yamaguchi,* asserting doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field. Appellant respectfully disagrees that there is motivation to combine the references and further disagree that these references are properly combinable.

As noted above with regard to claim 4, the portion of the reference the Examiner is relying upon in support of his rejection is based upon an interlaced VGA signal, which energizes pixels in an alternate manner. *Yamaguchi* reads out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit. Because only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by *Harada*. Support for this argument may be found in *Yamaguchi* in col. 12, lines 39-60.

Further, *Yamaguchi* specifically supports this argument by teaching "a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented." As such, Appellant maintains that one skilled in the art would not be motivated to combine the averaging of *Harada* with the teachings of *Yamaguchi*.

c. Yamaguchi teaches away from the purported combination

Yamaguchi seeks to provide a device that obtains "an image of a good resolution" (col. 17, lines 25-26). In combining the teachings of the references, as suggested by the Examiner, *Yamaguchi* would effectively be processing one energized or charged row of pixels with one non-energized or non-charged row of pixels. By doing this, signal quality would be reduced. This is contrary to the purpose and express teachings of *Yamaguchi* as noted above. As such, Appellant respectfully submits that one skilled in the art would not modify *Yamaguchi* as purported by the Examiner as *Yamaguchi* teaches away from the purported modification.

d. The rejection of independent claim 23 relies on impermissible hindsight reasoning

By asserting it would have been obvious to modify *Yamaguchi* to include the features of *Harada*, with no suggestion or motivation in the applied references or elsewhere to do so, the rejection appears to rely on impermissible hindsight reasoning. As such, Appellant maintains that independent claim 16 is patentable over *Yamaguchi* in view of *Harada*.

10. The Rejection Fails to Establish Prima Facie Obviousness of Independent Claim 24

Independent claim 24 is directed to A driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of applying gate pulses for dividing pixel information of all vertical lines into pixel information of a plurality of fields and transferring the pixel information to vertical transferring routes to transferring gates, each associated with a photoelectric transferring device,

when image signals with high definition are produced; applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said transferring gates when image signals with low definition are produced; and producing pixel information of one line from the pixel information of each pair of two adjoining lines from said solid imaging device when the image signals with the low definition are produced.

a. The cited references fail to teach or suggest all of the claim elements as set forth in independent claim 24

In maintaining the Examiner's rejection of independent claim 24, the Examiner asserts in the Final Official Action on page 8, "Re claim 24, see claim 6."

Appellant disagrees that *Harada* discloses producing image signals by producing the pixel information of one line from the pixel information of each pair of two adjoining lines read from the solid imaging device when the image signals with low definition are produced.

As noted above with regards to claim 4, *Harada* discloses processing one light-receiving signal with another light-receiving signal. However, according to the teachings of *Yamaguchi*, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such, in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, assuming these references are combinable which Appellant does not admit, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced."

As the Examiner has failed to provide references that teach or suggest all of the claim elements, Appellant respectfully submits the Examiner has failed to establish prima facie obviousness.

b. The Examiner has failed to provide proper motivation in support of his rejection of independent claim 24

The Examiner asserts it would have been obvious to one of ordinary skill in the art to modify the method disclosed in *Yamaguchi* to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by *Harada* in the image pickup device capable of performing a line thinning operation as disclosed by *Yamaguchi,* asserting doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field. Appellant respectfully disagrees that there is motivation to combine the references and further disagree that these references are properly combinable.

As noted above with regard to claim 4, the portion of the reference the Examiner is relying upon in support of his rejection is based upon an interlaced VGA signal, which energizes pixels in an alternate manner. *Yamaguchi* reads out two lines of pixels at a time in order to ensure that one energized or charged row of pixels is read out when the thinning takes place without complicating the signal processing circuit. Because only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by *Harada*. Support for this argument may be found in *Yamaguchi* in col. 12, lines 39-60.

Further, *Yamaguchi* specifically supports this argument by teaching "a situation such that a color sequence in the vertical direction which is specified by the array of the color filters is broken is prevented." As such, Appellant maintains that one skilled in the art would not be motivated to combine the averaging of *Harada* with the teachings of *Yamaguchi*.

c. Yamaguchi teaches away from the purported combination

Yamaguchi seeks to provide a device that obtains "an image of a good resolution" (col. 17, lines 25-26). In combining the teachings of the references, as suggested by the Examiner, *Yamaguchi* would effectively be processing one energized or charged row of pixels with one non-energized or non-charged row of pixels. By doing this, signal quality would be reduced. This is contrary to the purpose and express teachings of *Yamaguchi* as noted above. As such, Appellant respectfully submits that one skilled in the art would not modify *Yamaguchi* as purported by the Examiner as *Yamaguchi* teaches away from the purported modification.

d. The rejection of independent claim 24 relies on impermissible hindsight reasoning

By asserting it would have been obvious to modify *Yamaguchi* to include the features of *Harada*, with no suggestion or motivation in the applied references or elsewhere to do so, the rejection appears to rely on impermissible hindsight reasoning. As such, Appellant maintains that independent claim 16 is patentable over *Yamaguchi* in view of *Harada*.

X. CONCLUSION

For the reasons specifically set forth above, the outstanding rejections set forth in the Final Office Action should be reversed.

Respectfully submitted,

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IX. Claims APPENDIX A

4. An imaging apparatus comprising:

a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, said solid imaging device comprises a matrix of transferring gates, to which gate pulses for transferring only the pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes are applied when image signals with low definition are produced;

a shooting optical system that forms a subject image on a receiving surface of said solid imaging device;

a timing generator that drives said solid imaging device and reads pixel information from said solid imaging device, the timing generator applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes to said transferring gates when image signals with low definition are produced; and

a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

5. The imaging apparatus as set forth in claim 4, wherein said timing generator applies gate pulses for transferring pixel information of all the vertical lines to said vertical transferring routes without reducing the pixel information to said transferring gates at least when image signals with high definition are produced.

6. The imaging apparatus as set forth in claim 4, wherein said timing generator applies gate pulses for dividing pixel information of all the vertical lines into pixel information of a plurality of fields to transfer the pixel information to said vertical transferring routes to said transferring gates at least when image signals with high definition are produced.

7. The imaging apparatus as set forth in claim 4, wherein said signal processing device reduces pixel information of horizontal lines when image signals with low definition are produced.

8. The imaging apparatus as set forth in claim 4, wherein:

said signal processing device has an interpolation operation device that interpolates the image signals with the low definition to produce image signals; and

said signal processing device outputs image signals including the produced image signals.

9. The imaging apparatus as set forth in claim 4, further comprising a displaying device that displays a shot image according to the image signals with the low definition.

10. The imaging apparatus as set forth in claim 4, further comprising a recording device that records the image signals of the high definition.

11. A driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of:

applying gate pulses for transferring pixel information of all vertical lines to vertical transferring routes without reducing the pixel information to a matrix of transferring gates when image signals with high definition are produced;

applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said matrix of transferring gates when image signals with low definition are produced; and

producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

12. A driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of:

applying gate pulses for dividing pixel information of all vertical lines into pixel information of a plurality of fields and transferring the pixel information to vertical transferring routes to a matrix of transferring gates when image signals with high definition are produced;

applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said matrix of transferring gates when image signals with low definition are produced; and

producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

16. An imaging apparatus comprising:

a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, said solid imaging device comprises transferring gates, each associated with a photoelectric transferring device, to which gate pulses for transferring only the pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes are applied when image signals with low definition are produced;

a shooting optical system that forms a subject image on a receiving surface of said solid imaging device;

a timing generator that drives said solid imaging device and reads pixel information from said solid imaging device, the timing generator applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to vertical transferring routes to said transferring gates when image signals with low definition are produced; and

a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

17. The imaging apparatus as set forth in claim 16, wherein said timing generator applies gate pulses for transferring pixel information of all the vertical lines to said vertical transferring routes without reducing the pixel information to said transferring gates at least when image signals with high definition are produced.

18. The imaging apparatus as set forth in claim 16, wherein said timing generator applies gate pulses for dividing pixel information of all the vertical lines into pixel information of a

plurality of fields to transfer the pixel information to said vertical transferring routes to said transferring gates at least when image signals with high definition are produced.

19. The imaging apparatus as set forth in claim 16, wherein said signal processing device reduces pixel information of horizontal lines when image signals with low definition are produced.

20. The imaging apparatus as set forth in claim 16, wherein:

said signal processing device has an interpolation operation device that interpolates the image signals with the low definition to produce image signals; and

said signal processing device outputs image signals including the produced image signals.

21. The imaging apparatus as set forth in claim 16, further comprising a displaying device that displays a shot image according to the image signals with the low definition.

22. The imaging apparatus as set forth in claim 16, further comprising a recording device that records the image signals of the high definition.

23. A driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of:

applying gate pulses for transferring pixel information of all vertical lines to vertical transferring routes without reducing the pixel information to transferring gates, each associated with a photoelectric transferring device, when image signals with high definition are produced;

applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said transferring gates when image signals with low definition are produced; and

producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced.

24. A driving method for a solid imaging device in which pixel information of two adjoining lines composes color information of three primary colors, comprising the steps of:

applying gate pulses for dividing pixel information of all vertical lines into pixel information of a plurality of fields and transferring the pixel information to vertical transferring routes to transferring gates, each associated with a photoelectric transferring device, when image signals with high definition are produced;

applying gate pulses for transferring only pixel information of pairs of two adjoining lines with intervals of a plurality of lines to said vertical transferring routes to said transferring gates when image signals with low definition are produced; and

producing pixel information of one line from the pixel information of each pair of two adjoining lines from said solid imaging device when the image signals with the low definition are produced.

X. EVIDENCE APPENDIX B

There is no additional evidence pursuant to §§ 1.130, 1.131, or 1.132 and/or evidence entered by or relied upon by the examiner that is relevant to this appeal.

XI. RELATED PROCEEDINGS APPENDIX C

There are no related proceedings.